

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Pipe Couplings**

with type designation(s)

**Pipe couplings with retaining ring connection**

Issued to

**I.M.M. Hydraulics S.p.A.****Atessa CH, Italy**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems****DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Temperature range: -40°C to +200°C (see page 3)****Max. working press.: 50 bar to 420 bar (see page 2)****Sizes: 1/2" to 10" (see page 2)**Issued at **Høvik** on **2019-02-04**for **DNV GL**This Certificate is valid until **2023-06-30**.DNV GL local station: **Helsinki**Approval Engineer: **Maheshraja Venkatesan****Marianne Spæren Marveng**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-021477-2**  
 Certificate No: **TAP00000KN**  
 Revision No: **1**

## Product description

Pipe couplings with retaining ring connection

Material of construction for flanges:

- Carbon steel: S355, P355NL1
- Stainless steel: 1.4401, 1.4404, 1.4462 (UNS S32205) from EN 10028-7

Material of construction for piping connection:

- P235GH, ASTM A106 gr. B, E235 and E355
- Stainless steel: AISI 316, 1.4462 (UNS S32205) from EN 10028-7

Sealing material: NBR, FKM90

## Application/Limitation

Maximum working pressure [MWP]:

Type	Size ["]	Pipe OD (mm)		MWP [bar]
		'Schedule series'	'Metric size'	
308	½	21.3	26	350
608	½	21.3	26	420
312	¾	26.7	36	350
612	¾	26.7	36	420
316	1	33.4	39	350
616	1	33.4	39	420
320	1 ¼	42.4	46	280
620	1 ¼	42.4	42.4	420
124	1 ½	48.3	50	50
324	1 ½	48.3	56	280
424	1 ½	48.3	50	400
624	1 ½	42.4	46	420
132	2	60.3	60	50
332	2	60.3	66	280
432	2	60.3	66	400
632	2	60.3	66	420
140	2 ½	73	73	50
340	2 ½	73	80	210
440	2 ½	73	80	400
148	3	88.9	90	50
348	3	88.9	97	210
448	3	88.9	97	400
156	3 ½	101.6	100	50
164	4	114.3	115	50
456	4	114.3	115	345
860	4 ½	130	130	350
180	5	139.7	140	50
864	5	139.7	150	350
196	6	168.3	165	50
880	6	168.3	190	280
228	8	219.1	220	50
888	8	219.1	220	350
896	8	250	250	350
260	10	273	273	50
8160	10	273	273	250

Type	Pipe OD (mm)		Size ["]	MWP [bar]
	'Schedule series'	'Metric size'		
GS210SH15	½	21.3	26	210
GS210SS15	½	21.3	26	210
GS280K15	½	21.3	26	280
GS350K15	½	21.3	26	350
GS210SH20	¾	26.7	36	210
GS210SS20	¾	26.7	36	210
GS280K20	¾	26.7	36	280
GS350K20	¾	26.7	36	350
GS210SH25	1	33.4	39	210
GS210SS25	1	33.4	39	210
GS280K25	1	33.4	39	280
GS350K25	1	33.4	39	350
GS210SH32	1 ¼	42.4	46	210
GS210SS32	1 ¼	42.4	46	210
GS280K32	1 ¼	42.4	46	280
GS350K32	1 ¼	42.4	46	350
GS210SH40	1 ½	48.3	56	210
GS210SS40	1 ½	48.3	56	210
GS280K40	1 ½	48.3	56	280
GS350K40	1 ½	48.3	56	350
GS210SH50	2	60.3	66	210
GS210SS50	2	60.3	66	210
GS280K50	2	60.3	66	280
GS350K50	2	60.3	66	350
GS210SH65	2 ½	73	73	210
GS210SS65	2 ½	73	80	210
GS280K65	2 ½	73	80	280
GS350K65	2 ½	73	80	350
GS210SH80	3	88.9	97	210
GS210SS80	3	88.9	97	210
GS280K80	3	88.9	97	280
GS350K80	3	88.9	97	350

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The temperature range is dependant on the sealing material as follows:

NBR : -25 to +100 °C  
 FKM90 : -40 to +200 °C

The couplings covered by this certificate are approved to be used according to the latest requirements of governing rules in following applications:

<p><b>1) Flammable fluids (flash point ≤ 60°C)</b></p> <ul style="list-style-type: none"> <li>- Cargo oil lines <sup>(2)</sup></li> <li>- Crude oil washing lines <sup>(2)</sup></li> <li>- Vent lines</li> </ul> <p><b>2) Inert gas</b></p> <ul style="list-style-type: none"> <li>- Water seal effluent lines</li> <li>- Scrubber effluent lines</li> <li>- Main lines <sup>(1)(2)</sup></li> <li>- Distributions lines <sup>(2)</sup></li> </ul> <p><b>3) Flammable fluids (flash point &gt; 60°C)</b></p> <ul style="list-style-type: none"> <li>- Cargo oil lines <sup>(2)</sup></li> <li>- Fuel oil lines <sup>(1)</sup></li> <li>- Lubricating oil lines <sup>(1)</sup></li> <li>- Hydraulic oil <sup>(1)</sup></li> <li>- Thermal oil <sup>(1)</sup></li> </ul> <p><b>4) Sea water <sup>(4)</sup></b></p> <ul style="list-style-type: none"> <li>- Bilge lines</li> <li>- Water filled fire extinguishing systems, e.g. sprinkler systems</li> <li>- Non-water filled fire extinguishing systems, e.g. foam, drencher systems</li> <li>- Fire main (not permanently filled)</li> <li>- Ballast system</li> <li>- Cooling water system</li> <li>- Tank cleaning services</li> <li>- Non-essential systems</li> </ul>	<p><b>5) Fresh water</b></p> <ul style="list-style-type: none"> <li>- Cooling water system</li> <li>- Condensate return</li> <li>- Non-essential system</li> </ul> <p><b>6) Sanitary/drains/scuppers</b></p> <ul style="list-style-type: none"> <li>- Deck drains (internal) <sup>(3)</sup></li> <li>- Sanitary drains</li> <li>- Scuppers and discharge (overboard)</li> </ul> <p><b>7) Sounding/vent</b></p> <ul style="list-style-type: none"> <li>- Water tanks/dry spaces</li> <li>- Oil tanks (f.p. &gt; 60°C) <sup>(1)</sup></li> </ul> <p><b>8) Miscellaneous</b></p> <ul style="list-style-type: none"> <li>- Starting/control air</li> <li>- Service air (non-essential)</li> <li>- Brine</li> <li>- CO<sub>2</sub> system</li> <li>- Steam</li> </ul>
<p>(1) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.</p> <p>(2) Only in pump rooms and open decks</p> <p>(3) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.</p> <p>(4) Couplings made of specific material grade 1.4462 (UNS S32205) only are allowed in sea water systems, and only at room temperature conditions.</p>	

Materials chosen for the specific system shall be suitable for the intended medium and environmental conditions.

This approval is only valid when the couplings are assembled with tubing of correct temper and tolerances as recommended by the manufacturer.

For low temperature applications, impact testing requirements as given in relevant chapters of DNV GL Pt. 2 Ch. 2 shall be followed for the corresponding piping components (E.g., Flanges, bolts & nuts)

These couplings should not be used on tubes in cold fabricated (hard temper) conditions.

The installation of mechanical joints is to be in accordance with the manufacturer's assembly instructions.

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## **Type Approval documentation**

Catalogue 8990306602 'GS-FLANGE SYSTEM' Revision February 2016

Technical data sheet for: GS-JIS F7806 350K retain ring flanges, GS-JIS F7806 280K retain ring flanges & GS-JIS B2291 SH/SS retain ring flanges

Material data sheet for gasket FKM90: M01010000056-en\_08.04.2016

Test reports:-

Repeated assembly test for Type 124 dated 16.02.2010 witnessed by GL Surveyor  
Repeated assembly test for Type 312 dated 11.06.2010 witnessed by GL Surveyor  
Repeated assembly test for type 608 under drawing no. 2017-011-98 dated 2018-09-04  
Repeated assembly test for Type 632 dated 11.06.2010 witnessed by GL Surveyor  
Repeated assembly test for Type 164 dated 28.04.2010 witnessed by GL Surveyor  
Burst test dated 11.06.2010 witnessed by GL Surveyor  
Burst test for type 124 dated 16.02.2010 witnessed by GL Surveyor  
Burst test for Type 164 dated 28.04.2010 witnessed by GL Surveyor  
Burst test for Type 312 dated 11.06.2010 witnessed by GL Surveyor  
Burst test for type 612 under drawing no. 2017-011-80 witnessed by DNV GL Surveyor dated 2018-09-04  
Burst test for type 880 under drawing no. 2017-011-87 witnessed by DNV GL Surveyor dated 2018-09-04  
Burst test for type 348 dated 28.04.2010 witnessed by GL Surveyor  
Burst test for type 448 dated 11.06.2010 witnessed by GL Surveyor  
Burst test for type 456 under drawing no. 2017-011-82 witnessed by DNV GL Surveyor dated 2018-09-04  
Burst test report no. 2014XF206 witnessed by RINA dated 2014-08-26  
Fire test report no. VTT-S-4647-09, VTT-S-3335-09  
Leakage test after fire dated 2009-02-10, 2009-03-20 and 2009-05-20  
Leakage test after fire dated 2011-03-31  
Vibration & impulse test report no. VTT-S-03301-18  
Vibration & pressure impulse test no. VTT-S-04947-18  
Vibration & pressure impulse test report no. 2A2010-0422 dated 2010-12-29  
Tightness and Pull out test report no. S-04482-18  
Pull out test report no. VTT-S-02319-10 dated 2010-03-22

Authorization letter QA016/18 for change of ownership from GS Hydro to IMM Hydraulics

'Statement of specimen tightness tests' from Eurofins Expert Services Oy dated 2019-01-11

'Statement' from DNV GL Surveyor related to witnessed tests dated 2019-01-17

## **Tests carried out**

Tightness, Repeated assembly, Burst, Pull-out, fire, impulse and vibration.

## **Marking of product**

For traceability to this type approval, the couplings are at least to be marked with:

- manufacturer's name or trade mark
- type designation
- size

## **Periodical assessment**

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.